

PATENT ABSTRACTS OF JAPAN

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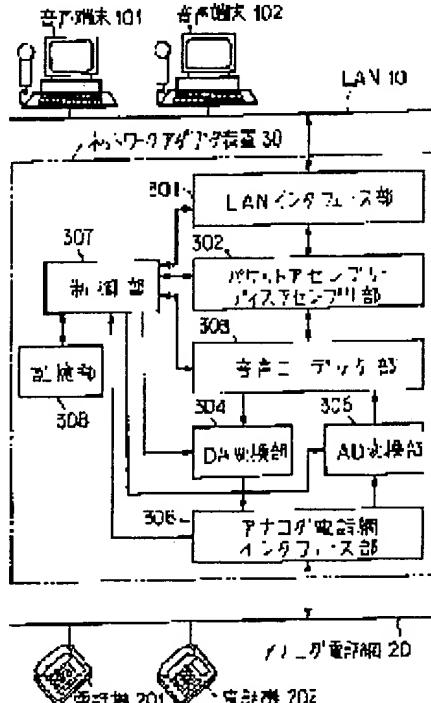
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(54) NETWORK ADAPTOR DEVICE

(57)Abstract:

PROBLEM TO BE SOLVED: To attain voice communication between an analog telephone set and a voice terminal equipment by applying A/D conversion to an analog voice signal, sending the result as a voice packet, applying D/A conversion to the voice packet and sending the result as an analog voice signal.

SOLUTION: A voice packet sent from a voice terminal equipment 101 connecting to a local area network(LAN) 10 is given to a voice CODEC section 303 from a packet assembly/disassembly section 302 of a network adaptor 30. Converted digital voice data are given to a D/A converter section 304 and an analog voice signal is sent to a telephone set 201 connecting to an analog telephone network 20. The analog voice signal received from the telephone set 201 is given to an A/D converter section 305. The converted digital voice data are given to the packet assembly/disassembly section 302 from the voice CODEC section 303 and vice data assembled into a packet are sent to the LAN 10.



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DETAILED DESCRIPTION

[Detailed Description of the Invention]**[0001]**

[Field of the Invention] In this invention, the interconversion between the analog voice signal of an analog telephone screen oversize and the packet of the digitized voice data on a Local Area Network (LAN) and the protocol conversion of sending-and-receiving control are especially carried out about a network adaptor device.

Therefore, it is related with the network adaptor device which carries out voice communication between the audio terminals connected with the analog telephone set connected to an analog telephone network at LAN.

[0002]

[Description of the Prior Art] As a network adaptor device which carries out real time communication between the mutual terminals connected to the network of a different kind, The former, Between the TV phones connected with the video voice communication terminal connected to LAN at a service synthesis digital network (ISDN). There is a gateway ("personal multimedia communication conference-system PMTC/LAN and its application" NTT R&D Vol.44 No.2 pp.181-188) which carries out video voice communication which can be set. In the video voice communication terminal linked to LAN, this gateway multiplexes digitization and the packet-ized video voice data on the frame of ITUT H.221 standard, and sends it out to an ISDN network.

On the other hand, the frame of ITUT H.221 standard received from the ISDN network is separated, The video voice packet which can be processed in the video voice communication terminal linked to LAN is assembled, The conversion process of the image coding mode which has a basic function which sends out this packet to LAN, and is needed for carrying out this basic function, It is a device which performs the protocol conversion between digital networks which performs the option/deletion of an error correcting code, transmission speed regulated treatment by addition/deletion of a staff bit, and other processings.

[0003]

[Problem(s) to be Solved by the Invention] The network adaptor device between ISDN-LAN for the conventional video voice data communications, It is developed in order to carry out interconnection of between the TV phones connected to the ISDN network which is a digital network as well as the terminal connected to LAN which is a digital network. In the communication which needs an image, the network adaptor device which has a protocol conversion function between the digital networks where a TV phone machine is usually connected with LAN is needed about the real time communication between the terminal connected to LAN, and the terminal connected to a common public network. If the number of the digital telephone machines also containing the TV phone machine connected to the number and ISDN network of the analog telephone set connected to an

analog telephone public network in a commercial scene in communication sufficient with just a sound on the other hand is compared, The necessity that the actual condition develops the network adaptor device which carries out communication between the analog telephone sets connected to the terminal connected to LAN and a common public network since the number of analog telephone sets is overwhelmingly superior is size more, By the interconversion of the analog voice signal of an analog telephone screen oversize, and the packet of the digitized voice data on LAN, and the protocol conversion of sending-and-receiving control. The appearance of the network adaptor device which carries out voice communication between the audio terminals connected with the analog telephone set connected to an analog telephone network at LAN is demanded.

[0004]Therefore, when this invention performs the interconversion between the analog voice signal of an analog telephone screen oversize, and the packet of the digitized voice data on LAN, and the protocol conversion of sending-and-receiving control, It sets it as the purpose to provide the network adaptor device which carries out voice communication between the audio terminals connected with the analog telephone set connected to an analog telephone network at LAN.

[0005]

[Means for Solving the Problem]In the network adaptor device 30 which connects with both sides of analog telephone network 20 and LAN10, and changes a protocol of the analog telephone network 20, and a protocol of LAN, Have a communication control function in the analog telephone network 20, and receipt of the analog telephone set 201 connected to the analog telephone network 20 or the call from 202 is carried out, Composition which sends out a call receiving packet to the audio terminal 101 connected to LAN10 specified from this telephone or 102 is provided, Mail arrival propriety of the audio terminal 101 connected to LAN10 to a call receiving packet or a mail arrival response packet from 102 is deciphered, Set up a talk path, when mail arrival is good, and composition which sends out an analog signal which shows a mail arrival failure when a message cannot be received to the analog telephone set 201 or 202 is provided, Composition which deciphers and carries out call origination of the telephone number of an analog telephone set which is connected to the analog telephone network 20, and which should be carried out call origination from a calling request packet which received from the audio terminal 101 connected to LAN10 or 102 is provided, When a call setup is completed between analog telephone sets of the call origination point, composition which sends out a packet which notifies the completion of connection to the audio terminal 101 connected to LAN10 with a calling request or 102, and sets up a talk path is provided, While the AD translation of the analog voice signal inputted via the analog telephone network 20 is carried out in talk path setting out, it makes it a packetized voice and sending out on LAN10, A network adaptor device possessing composition which carries out the DA translation of the packetized voice inputted via LAN10, and sends out an analog voice signal to the analog telephone network 20 was constituted.

[0006]And in [have one sort or two or more sorts of coding/decoding functions, and] the time of talk path setting out, Composition which performs a negotiation about a coding mode between audio terminals connected to LAN was provided, coding/decoding system was chosen based on a negotiation result, and a network adaptor device possessing composition which performs coding/decryption of voice data with a selected method was constituted.

[0007]Up to arrival of the completion packet of connection outputted from an audio terminal connected to LAN after carrying out receipt from an analog telephone set connected to an analog telephone network. Composition which sends out an analog signal which shows that a talk path is under setting out to an analog telephone set is provided, After receiving a calling request packet from an audio terminal connected to LAN until a call setup is completed between analog telephone sets of the call origination point, A network adaptor device possessing composition which sends out a packet which shows that a talk path is under setting out to an audio terminal which sent out a calling request packet was constituted.

[0008]

[Embodiment of the Invention] This embodiment of the invention is described with reference to the example of drawing 1. 30 is a network adaptor device by this invention. The packet assembly De Dis assembly part to which 301 performs a separation assembly of the packet of a LAN interface section and the digital packet data in which 302 was outputted and inputted, 303 a voice CODEC part and 304 a DA translation part and 305 An AD translation part, The control section which performs communications control in connection with [with respect to an analog telephone network interface section in 306] call origination and receipt in 307 and control of the whole device, and 308 are storage parts stores which memorize the information set and other data requirements of the adapter device. The coding mode of the voice CODEC part 303 is one kind or two or more kinds.

[0009] And the telephone by which the audio terminal by which 10 is connected to LAN and 101 and 102 are connected to LAN10, and 20 are connected to an analog telephone network, and 201 and 202 are connected to the analog telephone network 20 is shown. The network adaptor device 30 is connected to LAN10, and the IP address and other address information which were assigned beforehand are memorized to the storage parts store 308. The network adaptor device 30 is further connected also to the analog telephone network 20, and the telephone number is assigned beforehand. Thus, while the network adaptor device 30 can communicate with the terminal connected to LAN by a peculiar IP address and telephone number, it can carry out the telephone and communication which are connected to an analog telephone network. It can come to carry out voice communication between the telephones 201 connected to the audio terminal 101 connected to LAN 10 by this invention via this network adaptor device 30, and the analog telephone network 20. Hereafter, operation of the network adaptor device 30 is explained in detail.

[0010] (1) Explain the case where it sends to the telephone 201 connected to the analog telephone network 20 via the network adaptor device 30 from the audio terminal 101 connected to LAN10. First, the telephone number of the telephone 201 which serves as the IP address of the network adaptor device 30 and the partner of voice communication who relay communication from the audio terminal 101 is inputted by selection of the keyboard of the audio terminal 101, or the table information of this terminal. The communication start request (STRT) packet containing the telephone number of the telephone 201 which this connects to the analog telephone network 20 which is a calling request packet is outputted on LAN10 from the audio terminal 101.

[0011] When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, LAN interface section 301 judges that it is a packet to the network adaptor device 30, and inputs a packet into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. When the information which shows the telephone number and communication start request (STRT) of the telephone 201 to packet data is included, the control section 307 performs a call setup to the telephone 201 connected to the analog telephone network 20 via the analog telephone network interface section 306.

[0012] On the other hand, the control section 307 performs the negotiation of the coding mode of the packet assembly De Dis assembly part 302, LAN interface section 301, and the voice CODEC part 303 used for the audio terminal 101 and subsequent voice communications via LAN10, The coding mode used with the audio terminal 101 and the network adaptor device 30 is determined.

[0013] The control section 307 returns a packet via packet assembly De Dis assembly part 302, LAN interface section 301, and LAN10 under the call (ALERT) which calls the telephone 201 to the audio terminal 101 connected to LAN10, and shows that it is inside. When the user of the telephone 201 takes a receiver and the call setup of the telephone 201 and the network adaptor device 30 is completed, the control section 307 returns the completion (CONN) packet of connection which shows the response of the telephone 201 to the audio terminal 101 after checking completion of a call setup. Then, the network adaptor device 30 will be in a state during communication, and the audio terminal 101 and the telephone 201 will be in a voice communication state.

[0014] When voice communication is started, the audio terminal 101, The inputted audio signal is

digitized, it packetizes with the network adaptor with which the terminal concerned has this, the IP address of the network adaptor part 30 which is a call partner, and a self IP address are set as the header of a packetized voice, and the packetized voice is sent out on LAN10. LAN interface section 301 of the network adaptor device 30, When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, it judges that it is a packet to the network adaptor device 30, and a packet is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. The control section 307 analyzes the separated packet data, and when it is judged that it is voice data, packet data are inputted into the voice CODEC part 303 from the packet assembly De Dis assembly part 302. The voice CODEC part 303 decodes the coded voice data, and changes it into linear digital sound data. The changed digital sound data is inputted into the DA translation part 304, and is made into an analog voice signal. The changed analog voice signal is sent out to an analog telephone network via the analog telephone network interface section 306. Thus, the telephone 201 connected to the analog telephone network 20 can hear the sound inputted into the audio terminal 101 connected to LAN10.

[0015]On the other hand, the analog voice signal inputted from the telephone 201 is inputted into the AD translation part 305 via the analog telephone network interface section 306, and is changed into linear digital sound data. This digital sound data is inputted into the voice CODEC part 303, and after coding processing is performed, it is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 packetizes the inputted audio coded data, and sets the IP address of the audio terminal 101 and the network adaptor part 30 to a header. The packetized voice data is sent out on LAN10 via LAN interface section 301. The audio terminal 101 incorporates the packetized voice which the network adaptor device 30 with which the IP address of the self-terminal was given sent out, and changes and outputs it to an analog voice. Thus, the audio terminal 101 connected to LAN10 can hear the sound inputted into the telephone 201 connected to the analog telephone network 20.

[0016]The bidirectional voice communication between the telephones 201 connected to the audio terminal 101 connected to LAN10 and the analog telephone network 20 by the above is realizable. Although voice coding and the voice CODEC part 303 which carries out decoding processing were provided, the data volume of the voice data which digitized by performing voice coding and decoding processing by this was reduced in above-mentioned explanation and network load is reduced, When using a linear PCM sound signal, a voice CODEC part is not needed.

[0017](2) Explain the case where cut treating is performed from the audio terminal 101 during voice communication. When cutting is directed by selection of the keyboard of the audio terminal 101, or the table information of this terminal, the audio terminal 101 sends out on LAN10 the disconnect-request (DISC) packet which is a packet which shows a communication disconnect request. LAN interface section 301 of the network adaptor device 30, When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, it judges that it is a packet to the network adaptor device 30, and a packet is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. The control section 307 analyzes the separated packet data, and when it is judged that they are disconnect-request (DISC) packet data, it performs call clear-down processing between the telephones 201 via the analog telephone network interface section 306.

[0018](3) It faces sending to the telephone 201 via the network adaptor device 30 from the audio terminal 101, According to for example, the reason for using it for the voice communication between the audio terminal 102 and the telephone 202 which are audio terminals other than audio terminal 101 by which the network adaptor device 30 is connected to LAN10. The case where voice communication between the audio terminal 101 and the telephone 201 through the network adaptor 30 cannot be performed is explained.

[0019]Also in this case, the telephone number of the telephone 201 which serves as the IP address

of the network adaptor device 30 and the partner of voice communication who relay communication from the audio terminal 101 first is inputted by selection of the keyboard of the audio terminal 101, or the table information of this terminal. Thereby, the communication start request (STRT) packet containing the telephone number of the telephone 201 is outputted on LAN10 from the audio terminal 101.

[0020]When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, LAN interface section 301 judges that it is a packet to the network adaptor device 30, and inputs a packet into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. When recognized as the control section 307 analyzing these packet data, and this packet being a communication start request (STRT) packet, The busy (A-BUSY) packet data which are response packet data in which it is shown that the network adaptor device 30 is in use are sent out to the audio terminal 101 via the packet assembly De Dis assembly part 302 and LAN interface section 301. This notifies the audio terminal 101 that the network adaptor device 30 is in use.

[0021](4) Although it faces sending to the telephone 201 via the network adaptor device 30 from the audio terminal 101 and the network adaptor device 30 is not [be / it] under use, for example, since the telephone 201 is busy, The case where the call between the network adaptor device 30 and the telephone 201 is not established is explained. Also in this case, the telephone number of the telephone 201 which serves as the IP address of the network adaptor device 30 and the partner of voice communication who relay communication from the audio terminal 101 first is inputted by selection of the keyboard of the audio terminal 101, or the table information of this terminal.

Thereby, the communication start request (STRT) packet containing the telephone number of the telephone 201 is outputted on LAN10 from the audio terminal 101.

[0022]When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, LAN interface section 301 judges that it is a packet to the network adaptor device 30, and inputs a packet into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. The control section 307 analyzes these packet data, and when this packet has been recognized to be a communication start request (STRT) packet containing the telephone number of the telephone 201, it carries out call origination to the telephone 201 connected to the analog telephone network 20.

[0023]On the other hand, the control section 307 of the network adaptor device 30, A packet is returned via packet assembly De Dis assembly part 302, LAN interface section 301, and LAN10 under the call (ALERT) which is a response packet which calls the telephone 201 to the audio terminal 101 connected to LAN10, and shows that it is inside. Although the network adaptor device 30 carried out call origination to the telephone 201, here, When recognized as the telephone 201 being busy in the analog telephone network interface section 306, the control section 307, The busy (T-BUSY) packet which is a packet which shows during the conversation [of the telephone 201] is returned to the audio terminal 101 via packet assembly De Dis assembly part 302, LAN interface section 301, and LAN10 at the same time it stops a call setup. This notifies the audio terminal 101 that the telephone 201 is busy.

[0024](5) Explain the case where it sends to the audio terminal 101 connected to LAN10 via the network adaptor device 30 from the telephone 201 connected to the analog telephone network 20. First, call origination of the telephone number of the network adaptor device 30 which relays communication is carried out from the telephone 201 to the network adaptor device 30 by inputting by the push button PB of the telephone 201. After carrying out receipt in the analog telephone network interface section 306 and completing a call setup between the telephone 201 and the network adaptor device 30, the control section 307, The voice guidance which is an analog signal which demands the input of a local telephone number convertible into the IP address of the audio terminal 101 memorized by the IP address or the storage parts store 308 of the audio terminal 101 connected to LAN10 from a user to the telephone 201, It sends out to the telephone 201 via the DA

translation part 304, the analog telephone network interface section 306, and the analog telephone network 20. After the control section 307 receives waiting and this for reception of the PB signal which shows a local telephone number convertible into the IP address of the audio terminal 101 memorized by the IP address or the storage parts store 308 of the audio terminal 101 inputted from the push button PB of the telephone 201, The IP address of the audio terminal 101 is decoded from this PB signal. The IP address of the decoded audio terminal 101 is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302, The communication start request (STRT) packet which is a call receiving packet and which added the IP address of the network adaptor device 30 and the audio terminal 101 to the header is assembled, and this is outputted on LAN10 via LAN interface section 301. The audio terminal 101 judges that it is a packet towards a self-terminal from the IP address of the header of the sent-out communication start request (STRT) packet, and recognizes that there is a demand of a communication start from the network adaptor device 30 from the analysis result of these packet data. A packet is returned to the network adaptor device 30 under the call (ALERT) which shows that it is under call from the audio terminal 101 simultaneously with this recognition. After the packet which received calling the control section 307 and identifying that it is an inside (ALERT) packet, The analog signal which shows under a call, for example, ring back tone, is sent out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20.

[0025]When the user of the audio terminal 101 performs a mail arrival response, for example by the keyboard input of the audio terminal 101, or a click and others of a mouse, the completion (CONN) packet of connection which is a packet which shows that it answered is returned to the network adaptor device 30. The control section 307 is inputted via LAN interface section 301, The packet separated in the packet assembly De Dis assembly part 302 recognizes that it is the completion (CONN) packet of connection, and stops analog signal sending out which shows under the call sent out to the telephone 201. Then, the network adaptor device 30 will be in a state during communication, and can come to carry out voice communication between the telephone 201 and the audio terminal 101.

[0026]The two-way communication of the sound after a voice communication start is the same as that of the case where it sends to the telephone 201 connected to the analog telephone network 20 via the network adaptor device 30 from the audio terminal 101 connected to LAN10 explained previously.

(6) Explain the case where cut treating is performed from the telephone 201 during voice communication.

[0027]As for cut treating, the telephone 201 is performed more on hook and, thereby, the call between the telephone 201 and the network adaptor device 30 is cut. The control section 307 detects cutting of the call between the telephones 201 via the analog telephone network interface section 306, The communication cutting (DISC) packet which shows communication cutting in the packet assembly De Dis assembly part 302 is assembled, and this packet is sent out via LAN interface section 301 and LAN 10 to the audio terminal 101. Thereby, communication is cut.

[0028](7) It faces sending to the audio terminal 101 via the network adaptor device 30 from the telephone 201, For example, when the network adaptor device 30 is in use for voice communication with the audio terminal 102 connected to telephone [which is connected to the analog telephone network 20] 202, and LAN10, receipt of the network adaptor device 30 cannot be carried out from the telephone 201.

[0029](8) It faces sending to the audio terminal 101 via the network adaptor device 30 from the telephone 201, Although the network adaptor device 30 is not [be / it] under use, the case where the call between the network adaptor device 30 and the audio terminal 101 is not established is explained harder [which the user of the audio terminal 101 refuses mail arrival, or the audio terminal 101 does not answer, for example].

[0030]Call origination of the telephone number of the network adaptor device 30 which relays communication is first carried out from the telephone 201 to the network adaptor device 30 by inputting by the push button PB of the telephone 201 as mentioned above. After carrying out receipt in the analog telephone network interface section 306 and completing setting out of the call between the telephone 201 and the network adaptor device 30, the control section 307, The analog signal which demands the input of a local telephone number convertible into the IP address of the audio terminal memorized by the IP address or the storage parts store 308 of the audio terminal connected to LAN10 to the telephone 201 from a user, For example, a voice guidance is sent out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20. Then, after the control section 307 receives waiting and this for reception of the PB signal which shows a local telephone number convertible into the IP address of the audio terminal 101 memorized by the IP address or the storage parts store 308 of the audio terminal 101 inputted from the push button PB of the telephone 201, The IP address of the audio terminal 101 is decoded from this PB signal. The decoded IP address is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 assembles the communication start request (STRT) packet which added the IP address of the network adaptor device 30 and the audio terminal 101 to the header, and outputs this on LAN10 via LAN interface section 301.

[0031]The audio terminal 101 judges that it is a packet towards a self-terminal from the IP address of the header of the sent-out communication start request (STRT) packet, and recognizes that there is a demand of a communication start from the network adaptor device 30 from the analysis result of these packet data. Simultaneously with this recognition, a packet is returned to the network adaptor device 30 under the call (ALERT) which shows that the audio terminal 101 is under call. After the packet which received calling the control section 307 and identifying that it is an inside (ALERT) packet, The analog signal which shows under a call, for example, ring back tone, is sent out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20.

[0032]For that the audio terminal 101 has not started and other reasons, the network adaptor device 30, When not receiving a packet under the call (ALERT) from the audio terminal 101 within fixed time after carrying out communication start request (STRT) packet sending out, the control section 307 sends out the analog signal which shows a mail arrival failure, for example, a busy tone, to the telephone 201.

[0033]When the user of the audio terminal 101 refuses this to mail arrival by the keyboard input of the audio terminal 101, or a click and others of a mouse, the communication improper (T-BUSY) packet which is response packet data in which having refused is shown is returned to the network adaptor device 30. The control section 307 is inputted via LAN interface section 301, After detecting the communication improper (T-BUSY) packet separated in the packet assembly De Dis assembly part 302, Sending out of the analog signal which shows under the call sent out to the telephone 201 is stopped, and the analog signal which shows a mail arrival failure, for example, a busy tone, is sent out to the telephone 201.

[0034]

[Effect of the Invention]It is as above and can come to carry out voice communication by using the network adaptor device of this invention between the audio terminals connected with the common analog telephone set connected to an analog telephone network at LAN. And have one sort or two or more sorts of coding/decoding functions, and the negotiation about a coding mode is performed between the audio terminals connected to LAN at the time of talk path setting out, Reduce the transmission load on LAN by choosing coding/decoding system based on a negotiation result, and performing coding/decryption of voice data with the selected method, and. The range of choice of coding/decoding system spreads, and the kind of audio terminal on LAN which can telephone to the telephone connected to the analog telephone network increases.

[0035]Up to the arrival of the completion packet of connection outputted from the audio terminal connected to LAN after carrying out receipt from the analog telephone set connected to an analog telephone network. The analog signal which shows that a talk path is under setting out to an analog telephone set is sent out, After receiving a calling request packet from the audio terminal connected to LAN until a call setup is completed between the analog telephone sets of the call origination point, By providing the composition which sends out the packet which shows that a talk path is under setting out to the audio terminal which sent out the calling request packet, At the time of this voice communication, "under talk path installation", other messages, and a busy tone can be outputted to telephone while setting up a talk path, and each audio terminal with the gestalt in which an output is possible.

[0036]The sound inputted from the telephone connected to the analog telephone network according to the voice guidance accumulated in the audio terminal can be recorded by using the network adaptor device of this invention using the accumulating function of an audio terminal.

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TECHNICAL FIELD

[Field of the Invention]In this invention, the interconversion between the analog voice signal of an analog telephone screen oversize and the packet of the digitized voice data on a Local Area Network (LAN) and the protocol conversion of sending-and-receiving control are especially carried out about a network adaptor device.

Therefore, it is related with the network adaptor device which carries out voice communication between the audio terminals connected with the analog telephone set connected to an analog telephone network at LAN.

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CLAIMS

[Claim(s)]

[Claim 1]In a network adaptor device which connects with both sides of an analog telephone network and LAN, and changes a protocol of an analog telephone network, and a protocol of LAN, Have a communication control function in an analog telephone network, and receipt of the call from an analog telephone set connected to an analog telephone network is carried out, Composition which sends out a call receiving packet to an audio terminal connected to LAN specified from this telephone is provided, Mail arrival propriety of a mail arrival response packet from an audio terminal connected to LAN to a call receiving packet is deciphered, Set up a talk path, when mail arrival is good, and composition which sends out an analog signal which shows a mail arrival failure when a message cannot be received to an analog telephone set is provided, Composition which deciphers and carries out call origination of the telephone number of an analog telephone set which is connected to an analog telephone network, and which should be carried out call origination from a calling request packet which received from an audio terminal connected to LAN is provided, When a call setup is completed between analog telephone sets of the call origination point, While composition which sends out a packet which notifies the completion of connection to an audio terminal connected to LAN with a calling request, and sets a talk path as it is provided, the AD translation of the analog voice signal inputted via an analog telephone network is carried out in talk path setting out, it makes it a packetized voice and sending out on LAN, A network adaptor device characterized by what composition which carries out the DA translation of the packetized voice inputted via LAN, and sends out an analog voice signal to an analog telephone network is provided for.

[Claim 2]network adaptor device **** indicated to claim 1 -- it having one sort or two or more sorts of coding/decoding functions, and at the time of talk path setting out. Composition which performs a negotiation about a coding mode between audio terminals connected to LAN is provided, A network adaptor device which chooses coding/decoding system based on a negotiation result, and is characterized by what composition which performs coding/decryption of voice data with a selected method is provided for.

[Claim 3]network adaptor device **** indicated to claim 1 -- to arrival of the completion packet of connection outputted from an audio terminal connected to LAN, after carrying out receipt from an analog telephone set connected to an analog telephone network. Composition which sends out an analog signal which shows that a talk path is under setting out to an analog telephone set is provided, After receiving a calling request packet from an audio terminal connected to LAN until a call setup is completed between analog telephone sets of the call origination point, A network adaptor device characterized by what composition which sends out a packet which shows that a talk path is under setting out to an audio terminal which sent out a calling request packet is provided for.

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PRIOR ART

[Description of the Prior Art]As a network adaptor device which carries out real time communication between the mutual terminals connected to the network of a different kind, The former, Between the TV phones connected with the video voice communication terminal connected to LAN at a service synthesis digital network (ISDN). There is a gateway ("personal multimedia communication conference-system PMTC/LAN and its application" NTT R&D Vol.44 No.2 pp.181-188) which carries out video voice communication which can be set. In the video voice communication terminal linked to LAN, this gateway multiplexes digitization and the packet-ized video voice data on the frame of ITUT H.221 standard, and sends it out to an ISDN network. On the other hand, the frame of ITUT H.221 standard received from the ISDN network is separated, The video voice packet which can be processed in the video voice communication terminal linked to LAN is assembled, The conversion process of the image coding mode which has a basic function which sends out this packet to LAN, and is needed for carrying out this basic function, It is a device which performs the protocol conversion between digital networks which performs the option/deletion of an error correcting code, transmission speed regulated treatment by addition/deletion of a staff bit, and other processings.

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EFFECT OF THE INVENTION

[Effect of the Invention]It is as above and can come to carry out voice communication by using the network adaptor device of this invention between the audio terminals connected with the common analog telephone set connected to an analog telephone network at LAN. And have one sort or two or more sorts of coding/decoding functions, and the negotiation about a coding mode is performed between the audio terminals connected to LAN at the time of talk path setting out, Reduce the transmission load on LAN by choosing coding/decoding system based on a negotiation result, and performing coding/decryption of voice data with the selected method, and. The range of choice of coding/decoding system spreads, and the kind of audio terminal on LAN which can telephone to the telephone connected to the analog telephone network increases.

[0035]Up to the arrival of the completion packet of connection outputted from the audio terminal connected to LAN after carrying out receipt from the analog telephone set connected to an analog telephone network. The analog signal which shows that a talk path is under setting out to an analog telephone set is sent out, After receiving a calling request packet from the audio terminal connected to LAN until a call setup is completed between the analog telephone sets of the call origination point, By providing the composition which sends out the packet which shows that a talk path is under setting out to the audio terminal which sent out the calling request packet, At the time of this voice communication, "under talk path installation", other messages, and a busy tone can be outputted to telephone while setting up a talk path, and each audio terminal with the gestalt in which an output is possible.

[0036]The sound inputted from the telephone connected to the analog telephone network according to the voice guidance accumulated in the audio terminal can be recorded by using the network adaptor device of this invention using the accumulating function of an audio terminal.

[Translation done.]

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention]The network adaptor device between ISDN-LAN for the conventional video voice data communications, It is developed in order to carry out interconnection of between the TV phones connected to the ISDN network which is a digital network as well as the terminal connected to LAN which is a digital network. In the communication which needs an image, the network adaptor device which has a protocol conversion function between the digital networks where a TV phone machine is usually connected with LAN is needed about the real time communication between the terminal connected to LAN, and the terminal connected to a common public network. If the number of the digital telephone machines also containing the TV phone machine connected to the number and ISDN network of the analog telephone set connected to an analog telephone public network in a commercial scene in communication sufficient with just a sound on the other hand is compared, The necessity that the actual condition develops the network adaptor device which carries out communication between the analog telephone sets connected to the terminal connected to LAN and a common public network since the number of analog telephone sets is overwhelmingly superior is size more, By the interconversion of the analog voice signal of an analog telephone screen oversize, and the packet of the digitized voice data on LAN, and the protocol conversion of sending-and-receiving control. The appearance of the network adaptor device which carries out voice communication between the audio terminals connected with the analog telephone set connected to an analog telephone network at LAN is demanded.

[0004]Therefore, when this invention performs the interconversion between the analog voice signal of an analog telephone screen oversize, and the packet of the digitized voice data on LAN, and the protocol conversion of sending-and-receiving control, It sets it as the purpose to provide the network adaptor device which carries out voice communication between the audio terminals connected with the analog telephone set connected to an analog telephone network at LAN.

[Translation done.]

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MEANS

[Means for Solving the Problem]In the network adaptor device 30 which connects with both sides of analog telephone network 20 and LAN10, and changes a protocol of the analog telephone network 20, and a protocol of LAN, Have a communication control function in the analog telephone network 20, and receipt of the analog telephone set 201 connected to the analog telephone network 20 or the call from 202 is carried out, Composition which sends out a call receiving packet to the audio terminal 101 connected to LAN10 specified from this telephone or 102 is provided, Mail arrival propriety of the audio terminal 101 connected to LAN10 to a call receiving packet or a mail arrival response packet from 102 is deciphered, Set up a talk path, when mail arrival is good, and composition which sends out an analog signal which shows a mail arrival failure when a message cannot be received to the analog telephone set 201 or 202 is provided, Composition which deciphers and carries out call origination of the telephone number of an analog telephone set which is connected to the analog telephone network 20, and which should be carried out call origination from a calling request packet which received from the audio terminal 101 connected to LAN10 or 102 is provided, When a call setup is completed between analog telephone sets of the call origination point, composition which sends out a packet which notifies the completion of connection to the audio terminal 101 connected to LAN10 with a calling request or 102, and sets up a talk path is provided, While the AD translation of the analog voice signal inputted via the analog telephone network 20 is carried out in talk path setting out, it makes it a packetized voice and sending out on LAN10, A network adaptor device possessing composition which carries out the DA translation of the packetized voice inputted via LAN10, and sends out an analog voice signal to the analog telephone network 20 was constituted.

[0006]And in [have one sort or two or more sorts of coding/decoding functions, and] the time of talk path setting out, Composition which performs a negotiation about a coding mode between audio terminals connected to LAN was provided, coding/decoding system was chosen based on a negotiation result, and a network adaptor device possessing composition which performs coding/decryption of voice data with a selected method was constituted.

[0007]Up to arrival of the completion packet of connection outputted from an audio terminal connected to LAN after carrying out receipt from an analog telephone set connected to an analog telephone network. Composition which sends out an analog signal which shows that a talk path is under setting out to an analog telephone set is provided, After receiving a calling request packet from an audio terminal connected to LAN until a call setup is completed between analog telephone sets of the call origination point, A network adaptor device possessing composition which sends out a packet which shows that a talk path is under setting out to an audio terminal which sent out a calling request packet was constituted.

[0008]

[Embodiment of the Invention]This embodiment of the invention is described with reference to the example of drawing 1. 30 is a network adaptor device by this invention. The packet assembly De Dis

assembly part to which 301 performs a separation assembly of the packet of a LAN interface section and the digital packet data in which 302 was outputted and inputted, 303 a voice CODEC part and 304 a DA translation part and 305 An AD translation part, The control section which performs communications control in connection with [with respect to an analog telephone network interface section in 306] call origination and receipt in 307 and control of the whole device, and 308 are storage parts stores which memorize the information set and other data requirements of the adapter device. The coding mode of the voice CODEC part 303 is one kind or two or more kinds. [0009]And the telephone by which the audio terminal by which 10 is connected to LAN and 101 and 102 are connected to LAN10, and 20 are connected to an analog telephone network, and 201 and 202 are connected to the analog telephone network 20 is shown. The network adaptor device 30 is connected to LAN10, and the IP address and other address information which were assigned beforehand are memorized to the storage parts store 308. The network adaptor device 30 is further connected also to the analog telephone network 20, and the telephone number is assigned beforehand. Thus, while the network adaptor device 30 can communicate with the terminal connected to LAN by a peculiar IP address and telephone number, it can carry out the telephone and communication which are connected to an analog telephone network. It can come to carry out voice communication between the telephones 201 connected to the audio terminal 101 connected to LAN 10 by this invention via this network adaptor device 30, and the analog telephone network 20. Hereafter, operation of the network adaptor device 30 is explained in detail.

[0010](1) Explain the case where it sends to the telephone 201 connected to the analog telephone network 20 via the network adaptor device 30 from the audio terminal 101 connected to LAN10. First, the telephone number of the telephone 201 which serves as the IP address of the network adaptor device 30 and the partner of voice communication who relay communication from the audio terminal 101 is inputted by selection of the keyboard of the audio terminal 101, or the table information of this terminal. The communication start request (STRT) packet containing the telephone number of the telephone 201 which this connects to the analog telephone network 20 which is a calling request packet is outputted on LAN10 from the audio terminal 101.

[0011]When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, LAN interface section 301 judges that it is a packet to the network adaptor device 30, and inputs a packet into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. When the information which shows the telephone number and communication start request (STRT) of the telephone 201 to packet data is included, the control section 307 performs a call setup to the telephone 201 connected to the analog telephone network 20 via the analog telephone network interface section 306.

[0012]On the other hand, the control section 307 performs the negotiation of the coding mode of the packet assembly De Dis assembly part 302, LAN interface section 301, and the voice CODEC part 303 used for the audio terminal 101 and subsequent voice communications via LAN10, The coding mode used with the audio terminal 101 and the network adaptor device 30 is determined.

[0013]The control section 307 returns a packet via packet assembly De Dis assembly part 302, LAN interface section 301, and LAN10 under the call (ALERT) which calls the telephone 201 to the audio terminal 101 connected to LAN10, and shows that it is inside. When the user of the telephone 201 takes a receiver and the call setup of the telephone 201 and the network adaptor device 30 is completed, the control section 307 returns the completion (CONN) packet of connection which shows the response of the telephone 201 to the audio terminal 101 after checking completion of a call setup. Then, the network adaptor device 30 will be in a state during communication, and the audio terminal 101 and the telephone 201 will be in a voice communication state.

[0014]When voice communication is started, the audio terminal 101, The inputted audio signal is digitized, it packetizes with the network adaptor with which the terminal concerned has this, the IP address of the network adaptor part 30 which is a call partner, and a self IP address are set as the

header of a packetized voice, and the packetized voice is sent out on LAN10. LAN interface section 301 of the network adaptor device 30, When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, it judges that it is a packet to the network adaptor device 30, and a packet is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. The control section 307 analyzes the separated packet data, and when it is judged that it is voice data, packet data are inputted into the voice CODEC part 303 from the packet assembly De Dis assembly part 302. The voice CODEC part 303 decodes the coded voice data, and changes it into linear digital sound data. The changed digital sound data is inputted into the DA translation part 304, and is made into an analog voice signal. The changed analog voice signal is sent out to an analog telephone network via the analog telephone network interface section 306. Thus, the telephone 201 connected to the analog telephone network 20 can hear the sound inputted into the audio terminal 101 connected to LAN10.

[0015]On the other hand, the analog voice signal inputted from the telephone 201 is inputted into the AD translation part 305 via the analog telephone network interface section 306, and is changed into linear digital sound data. This digital sound data is inputted into the voice CODEC part 303, and after coding processing is performed, it is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 packetizes the inputted audio coded data, and sets the IP address of the audio terminal 101 and the network adaptor part 30 to a header. The packetized voice data is sent out on LAN10 via LAN interface section 301. The audio terminal 101 incorporates the packetized voice which the network adaptor device 30 with which the IP address of the self-terminal was given sent out, and changes and outputs it to an analog voice. Thus, the audio terminal 101 connected to LAN10 can hear the sound inputted into the telephone 201 connected to the analog telephone network 20.

[0016]The bidirectional voice communication between the telephones 201 connected to the audio terminal 101 connected to LAN10 and the analog telephone network 20 by the above is realizable. Although voice coding and the voice CODEC part 303 which carries out decoding processing were provided, the data volume of the voice data which digitized by performing voice coding and decoding processing by this was reduced in above-mentioned explanation and network load is reduced, When using a linear PCM sound signal, a voice CODEC part is not needed.

[0017](2) Explain the case where cut treating is performed from the audio terminal 101 during voice communication. When cutting is directed by selection of the keyboard of the audio terminal 101, or the table information of this terminal, the audio terminal 101 sends out on LAN10 the disconnect-request (DISC) packet which is a packet which shows a communication disconnect request. LAN interface section 301 of the network adaptor device 30, When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, it judges that it is a packet to the network adaptor device 30, and a packet is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. The control section 307 analyzes the separated packet data, and when it is judged that they are disconnect-request (DISC) packet data, it performs call clear-down processing between the telephones 201 via the analog telephone network interface section 306.

[0018](3) It faces sending to the telephone 201 via the network adaptor device 30 from the audio terminal 101, According to for example, the reason for using it for the voice communication between the audio terminal 102 and the telephone 202 which are audio terminals other than audio terminal 101 by which the network adaptor device 30 is connected to LAN10. The case where voice communication between the audio terminal 101 and the telephone 201 through the network adaptor 30 cannot be performed is explained.

[0019]Also in this case, the telephone number of the telephone 201 which serves as the IP address of the network adaptor device 30 and the partner of voice communication who relay communication from the audio terminal 101 first is inputted by selection of the keyboard of the audio terminal 101,

or the table information of this terminal. Thereby, the communication start request (STRT) packet containing the telephone number of the telephone 201 is outputted on LAN10 from the audio terminal 101.

[0020]When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, LAN interface section 301 judges that it is a packet to the network adaptor device 30, and inputs a packet into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. When recognized as the control section 307 analyzing these packet data, and this packet being a communication start request (STRT) packet, The busy (A-BUSY) packet data which are response packet data in which it is shown that the network adaptor device 30 is in use are sent out to the audio terminal 101 via the packet assembly De Dis assembly part 302 and LAN interface section 301. This notifies the audio terminal 101 that the network adaptor device 30 is in use.

[0021](4) Although it faces sending to the telephone 201 via the network adaptor device 30 from the audio terminal 101 and the network adaptor device 30 is not [be / it] under use, for example, since the telephone 201 is busy, The case where the call between the network adaptor device 30 and the telephone 201 is not established is explained. Also in this case, the telephone number of the telephone 201 which serves as the IP address of the network adaptor device 30 and the partner of voice communication who relay communication from the audio terminal 101 first is inputted by selection of the keyboard of the audio terminal 101, or the table information of this terminal. Thereby, the communication start request (STRT) packet containing the telephone number of the telephone 201 is outputted on LAN10 from the audio terminal 101.

[0022]When the IP address memorized by the storage parts store 308 is set as the header of a packet which is flowing on LAN10, LAN interface section 301 judges that it is a packet to the network adaptor device 30, and inputs a packet into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 separates the inputted packet data. The control section 307 analyzes these packet data, and when this packet has been recognized to be a communication start request (STRT) packet containing the telephone number of the telephone 201, it carries out call origination to the telephone 201 connected to the analog telephone network 20.

[0023]On the other hand, the control section 307 of the network adaptor device 30, A packet is returned via packet assembly De Dis assembly part 302, LAN interface section 301, and LAN10 under the call (ALERT) which is a response packet which calls the telephone 201 to the audio terminal 101 connected to LAN10, and shows that it is inside. Although the network adaptor device 30 carried out call origination to the telephone 201, here, When recognized as the telephone 201 being busy in the analog telephone network interface section 306, the control section 307, The busy (T-BUSY) packet which is a packet which shows during the conversation [of the telephone 201] is returned to the audio terminal 101 via packet assembly De Dis assembly part 302, LAN interface section 301, and LAN10 at the same time it stops a call setup. This notifies the audio terminal 101 that the telephone 201 is busy.

[0024](5) Explain the case where it sends to the audio terminal 101 connected to LAN10 via the network adaptor device 30 from the telephone 201 connected to the analog telephone network 20. First, call origination of the telephone number of the network adaptor device 30 which relays communication is carried out from the telephone 201 to the network adaptor device 30 by inputting by the push button PB of the telephone 201. After carrying out receipt in the analog telephone network interface section 306 and completing a call setup between the telephone 201 and the network adaptor device 30, the control section 307, The voice guidance which is an analog signal which demands the input of a local telephone number convertible into the IP address of the audio terminal 101 memorized by the IP address or the storage parts store 308 of the audio terminal 101 connected to LAN10 from a user to the telephone 201, It sends out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20. After the control section 307 receives waiting and this for reception of the PB signal

which shows a local telephone number convertible into the IP address of the audio terminal 101 memorized by the IP address or the storage parts store 308 of the audio terminal 101 inputted from the push button PB of the telephone 201, The IP address of the audio terminal 101 is decoded from this PB signal. The IP address of the decoded audio terminal 101 is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302, The communication start request (STRT) packet which is a call receiving packet and which added the IP address of the network adaptor device 30 and the audio terminal 101 to the header is assembled, and this is outputted on LAN10 via LAN interface section 301. The audio terminal 101 judges that it is a packet towards a self-terminal from the IP address of the header of the sent-out communication start request (STRT) packet, and recognizes that there is a demand of a communication start from the network adaptor device 30 from the analysis result of these packet data. A packet is returned to the network adaptor device 30 under the call (ALERT) which shows that it is under call from the audio terminal 101 simultaneously with this recognition. After the packet which received calling the control section 307 and identifying that it is an inside (ALERT) packet, The analog signal which shows under a call, for example, ring back tone, is sent out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20.

[0025]When the user of the audio terminal 101 performs a mail arrival response, for example by the keyboard input of the audio terminal 101, or a click and others of a mouse, the completion (CONN) packet of connection which is a packet which shows that it answered is returned to the network adaptor device 30. The control section 307 is inputted via LAN interface section 301, The packet separated in the packet assembly De Dis assembly part 302 recognizes that it is the completion (CONN) packet of connection, and stops analog signal sending out which shows under the call sent out to the telephone 201. Then, the network adaptor device 30 will be in a state during communication, and can come to carry out voice communication between the telephone 201 and the audio terminal 101.

[0026]The two-way communication of the sound after a voice communication start is the same as that of the case where it sends to the telephone 201 connected to the analog telephone network 20 via the network adaptor device 30 from the audio terminal 101 connected to LAN10 explained previously.

(6) Explain the case where cut treating is performed from the telephone 201 during voice communication.

[0027]As for cut treating, the telephone 201 is performed more on hook and, thereby, the call between the telephone 201 and the network adaptor device 30 is cut. The control section 307 detects cutting of the call between the telephones 201 via the analog telephone network interface section 306, The communication cutting (DISC) packet which shows communication cutting in the packet assembly De Dis assembly part 302 is assembled, and this packet is sent out via LAN interface section 301 and LAN 10 to the audio terminal 101. Thereby, communication is cut.

[0028](7) It faces sending to the audio terminal 101 via the network adaptor device 30 from the telephone 201, For example, when the network adaptor device 30 is in use for voice communication with the audio terminal 102 connected to telephone [which is connected to the analog telephone network 20] 202, and LAN10, receipt of the network adaptor device 30 cannot be carried out from the telephone 201.

[0029](8) It faces sending to the audio terminal 101 via the network adaptor device 30 from the telephone 201, Although the network adaptor device 30 is not [be / it] under use, the case where the call between the network adaptor device 30 and the audio terminal 101 is not established is explained harder [which the user of the audio terminal 101 refuses mail arrival, or the audio terminal 101 does not answer, for example].

[0030]Call origination of the telephone number of the network adaptor device 30 which relays communication is first carried out from the telephone 201 to the network adaptor device 30 by

inputting by the push button PB of the telephone 201 as mentioned above. After carrying out receipt in the analog telephone network interface section 306 and completing setting out of the call between the telephone 201 and the network adaptor device 30, the control section 307, The analog signal which demands the input of a local telephone number convertible into the IP address of the audio terminal memorized by the IP address or the storage parts store 308 of the audio terminal connected to LAN10 to the telephone 201 from a user, For example, a voice guidance is sent out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20. Then, after the control section 307 receives waiting and this for reception of the PB signal which shows a local telephone number convertible into the IP address of the audio terminal 101 memorized by the IP address or the storage parts store 308 of the audio terminal 101 inputted from the push button PB of the telephone 201, The IP address of the audio terminal 101 is decoded from this PB signal. The decoded IP address is inputted into the packet assembly De Dis assembly part 302. The packet assembly De Dis assembly part 302 assembles the communication start request (STRT) packet which added the IP address of the network adaptor device 30 and the audio terminal 101 to the header, and outputs this on LAN10 via LAN interface section 301.

[0031]The audio terminal 101 judges that it is a packet towards a self-terminal from the IP address of the header of the sent-out communication start request (STRT) packet, and recognizes that there is a demand of a communication start from the network adaptor device 30 from the analysis result of these packet data. Simultaneously with this recognition, a packet is returned to the network adaptor device 30 under the call (ALERT) which shows that the audio terminal 101 is under call. After the packet which received calling the control section 307 and identifying that it is an inside (ALERT) packet, The analog signal which shows under a call, for example, ring back tone, is sent out to the telephone 201 via the DA translation part 304, the analog telephone network interface section 306, and the analog telephone network 20.

[0032]For that the audio terminal 101 has not started and other reasons, the network adaptor device 30, When not receiving a packet under the call (ALERT) from the audio terminal 101 within fixed time after carrying out communication start request (STRT) packet sending out, the control section 307 sends out the analog signal which shows a mail arrival failure, for example, a busy tone, to the telephone 201.

[0033]When the user of the audio terminal 101 refuses this to mail arrival by the keyboard input of the audio terminal 101, or a click and others of a mouse, the communication improper (T-BUSY) packet which is response packet data in which having refused is shown is returned to the network adaptor device 30. The control section 307 is inputted via LAN interface section 301, After detecting the communication improper (T-BUSY) packet separated in the packet assembly De Dis assembly part 302, Sending out of the analog signal which shows under the call sent out to the telephone 201 is stopped, and the analog signal which shows a mail arrival failure, for example, a busy tone, is sent out to the telephone 201.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1]The block diagram explaining an example.

[Description of Notations]

10 LAN

The audio terminal connected to 101 and 102 LAN

20 Analog telephone network

Telephone connected to 201 and a 202 analog-telephone network

30 Network adaptor device

301 LAN interface section

302 Packet assembly De Dis assembly part

303 Voice codec

304 DA translation part

305 AD translation part

306 Analog telephone network interface section

307 Control section

308 Storage parts store

[Translation done.]

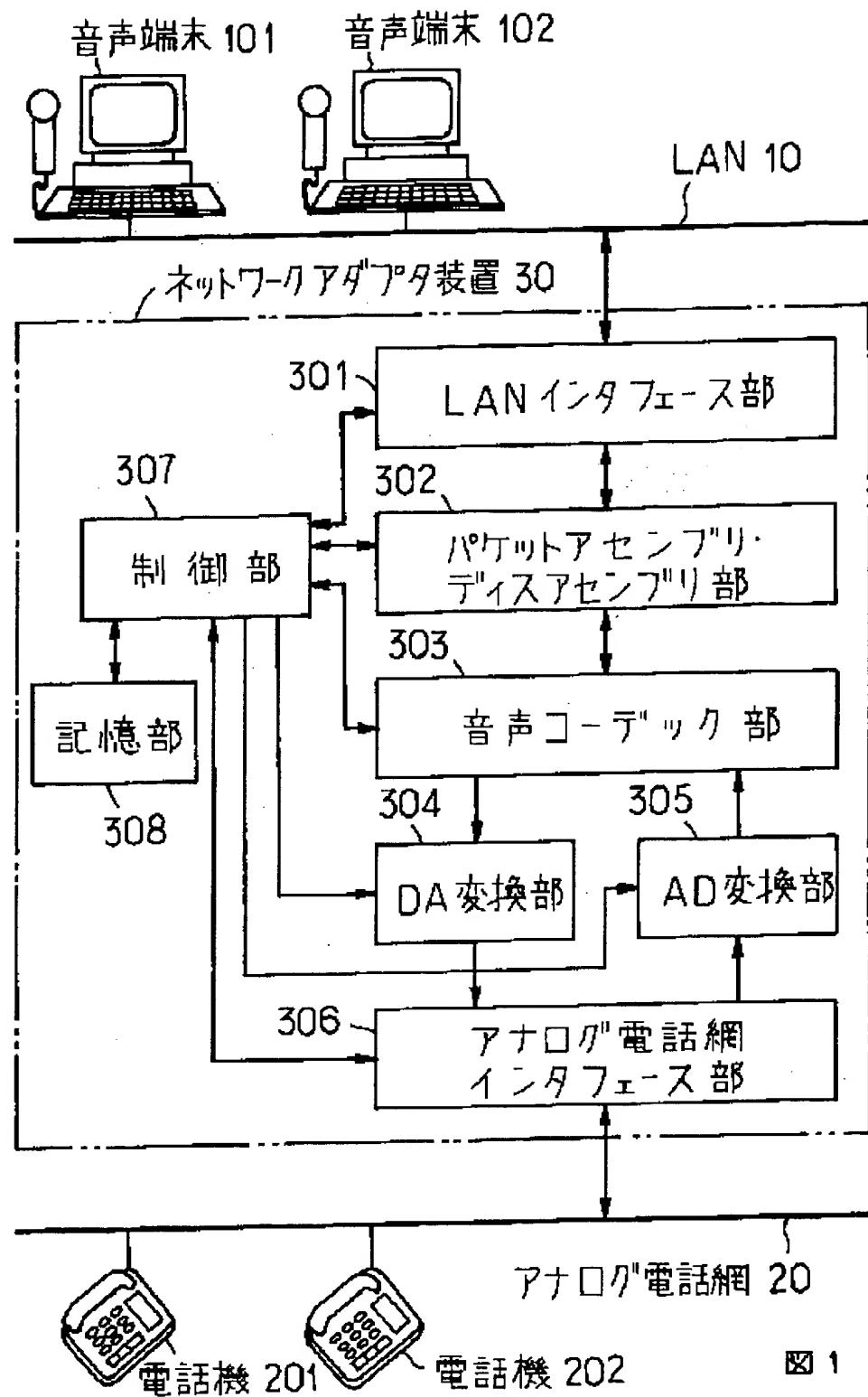


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